International Journal of Phytomedicine 3 (2011) 32-35
http://www.arjournals.org/index.php/ijpm/index

Short communication

ISSN: 0975-0185

Phytochemical investigation of extract of *Amorphophallus campanulatus* tubers

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Abstract

Pharmacognostic evaluation of *Amorphophallus campanulatus* tubers for alkaloids, saponins, coumarins, tannin, steroids, flavones, quinones, proteins phenols, carbohydrates. It was concluded that the extract of tuber contain important constitutents for pharmacological acitivity

Keywords: Phytochemical Screening, Amorphophallus campanulatus, tuber.

Introduction

Traditional plant medicines serve as a source of various types of active principle & WHO estimates 70% of the world population still relies on the herbal medicines. Out of the total 2, 25,000 species of plants, only less than 10% have been studied so far for their medicinal uses[1]. India has rich flora of herbal plants and ancient medical system are several hundred years old (Sukumar, E., 1989).*Amorphophallus campanulatus* (Roxb.) blume belonging to the family Araceae, commonly known as elephant root or suram etc, It consists of dried mature tubers of large perennial, subscandent shrub, found through out India and occasionally cultivated in gardens. The tuber is a flattened rough sphere weighing as much as 5-15 kg. Outer surface dark brown and inner surface is pale yellow and starchy[2]. And this is used traditionally for the treatment of tumours, piles, abdominal pain, and enlargement of spleen, asthma and also in rheumatism. Most of the studies showed that in Siddha medicine *Amorphophallus campanulatus* is used in the treatment of piles. *Amorphophallus campanulatus* is distributed in Bengal, Uttar Gujarat, Maharashtra, & Ceylon and North India[3].

Materials and methods

The specimens of *Amorphophallus campanulatus* tubers were procured from porur market, Chennai, authenticated in Department of Pharmacognosy, Sri Ramachandra college of Pharmacy, Sri Ramachandra University, Chennai. The Herbarium of the specimen is deposited in the museum. The *Amorphophallus campanulatus* tubers were collected and trimmed into proper size and the extract was collected by using different solvents.

Phytochemical Screening

The different chemical tests were performed for establishing profile of the extract for its chemical composition, the following chemical tests for various phytoconstituents in the hexane, chloroform, ethyl acetate, ethanol and hydroalcoholic extracts were carried out as described below (Harborne, 1974). The extracts were hydrolyzed with dil. HCl, the following tests were performed[4].

(a)Test for alkaloids:

i) Dragendroff's Test: In a test tube containing 1ml of extract, few drops of dragendroff's reagent was added and the color developed was

noticed. Appearance oforange color indicates the presence of alkaloids.

ii) Wagner's Test: To the extract, 2ml of wagner's reagent was added, the formation of a reddish brown precipitate indicates the presence of alkaloids.

ii) Mayer's Test: To the extract, 2ml of mayer's reagent was added, a dull white precipitate revealed the presence of alkaloids.

iv) Hager's Test: To the extract, 3 ml of hager's reagent was added, the formation of yellow precipitate confirmed the presence of alkaloids.

(b) Test for tri-terpenoids:

i) Salkowski test: To 1 ml of extract, tin (one bit) and thionyl chloride were added. Appearance of pink color indicates the presence of tri-terpenoids.

ii) Hirshonn reaction: When a substance was heated with trichloro acetic acid, red to purple color was observed.

(c)Test for coumarins:

To 1 ml of extract, 1 ml of 10% sodium hydroxide was added. The presence of coumarins is indicated by the formation of yellow color.

(d)Test for steroids:

i) Liebermann Burchard Test: To 1mL of extract, 1mL of glacial acetic acid and 1mL of acetic anhydride and two drops of concentrated sulphuric acid were added. The solution becomes red, then blue and finally bluish green, indicates the presence of steroids.

(e)Test for tannins:

i) To the extract, ferric chloride was added, formation of a dark blue or greenish black color showed the presence of tannins.

(f)Test for saponins:

To 1 ml of the extract, 5 ml of water was added and the tube was shaken vigorously. Copious lather formation indicates the presence of Saponins.

(g)Test for flavones:

i) Shinoda Test: To the extract, a few magnesium turnings and 1-2 drops of conc.HCl Were added; formation of red color shows the presence of flavones.

(h)Test for quinones:

To 1 ml of the extract, 1 ml of concentrated sulphuric acid was added. Formation of red color shows the presence of Quinones.

(i)Test for flavanones:

i) To the substance, 10% sodium hydroxide was added; yellow to orange color shows the presence of flavanones.

ii) To the substance conc. sulphuric acid was added, orange to crimson red color confirms the presence of flavanones.

(j)Test for anthocyanins:

i)To the substance, 10% sodium hydroxide was added; blue color shows the presence of anthocyanins.

ii) To the substance conc. sulphuric acid was added, yellowish orange color confirms the presence of anthocyanins.

(k)Test for anthraquinones:

Borntrager's Test: The extract was macerated with ether and after filtration, aqueous ammonia or caustic soda was added. Pink red or violet color in the aqueous layer after shaking indicates the presence of anthraquinones.

(l)Test for phenols:

Ferric chloride test: To the extract, few drops of 10 % aqueous ferric chloride were added. Appearance of blue or green color indicates the presence of phenols.

(m)Test for proteins:

i) Biuret Test: To the extract, 1ml of 40% sodium hydroxide solution and two drops of one percent copper sulphate solution were added. Formation of violet color indicates the presence of proteins.

ii) Xanthoprotein Test: To the extract, 1ml of concentrated nitric acid was added. As a white precipitate was formed, it is boiled and cooled. Then, 20% of sodium hydroxide or ammonia was added. Orange color indicates the presence of aromatic amino acids.

iii) Tannic Acid Test: To the extract, 10% tannic acid was added. Formation of white precipitate indicates the presence of proteins.

(n)Test for carbohydrates:

i**) Molisch's Test:** To the extract, 1ml of alpha-naphthol solution, and concentrated sulphuric acid through the sides of test tube were added. Purple or reddish violet colour at the junction of the two liquids revealed the presence of carbohydrates.

ii) Fehling's Test: To the extract, equal quantities of fehling's solution A and B were added and on heating, formation of a brick red precipitate indicates the presence of carbohydrates.

iii) Benedict's Test: To 5ml of Benedict's reagent, extract was added and boiled for two minutes and cooled. Formation of a red precipitate showed the presence of carbohydrates.

(o)Test for glycosides:

The extract was mixed with a little anthrone on a watch glass. One drop of concentrated sulphuric acid was added and made into a paste, warmed gently over water bath. The presence of glycosides was identified by dark green coloration.(p)Test for amino acids:

Ninhydrin test: About 2 drops of ninhydrin solution were added to the substance, a characteristic purple color indicates the presence of amino acids.

Results:

Table1: Preliminary Phytochemical Screening of *Amorphophallus campanulatus* tuber.

Chemical constitutents	**Test**	**Extracts**				
		Hexane	**Chloroform**	**Ethyl acetate**	**Alcohol**	**Hydro Alcohol**
	Dragendroff's test	+	+	+	+	+
	Wagner's test	+	-	+	-	+
	Mayers test	+	-	-	-	+
Alkaloids	Hagers test	-	-	-	-	+
	Salkowski test	-	-	-	-	+
Triterpenoid	Hirshonn reaction	-	-	-	-	+
Flavones	Shinoda test	+	-	+	+	-
	Biuret	-	-	-	-	-
Proteins	Xanthoprotein	-	-	-	-	+
	Molischs test	+	+	+	+	+
	Fehlings test	+	+	+	+	+
Carbohydrate	benedicts test	+	+	+	+	+
Aimno acids	Ninhydrin test	-	-	-	-	+
Glycosides		-	-	-	-	-
Courmarin		-	-	+	-	+
Steriods	Liebermann Burchard Test	-	-	-	+	+
Saponins		-	-	+	+	-
Tannins		-	-	-	+	+
Quinones		-	-	-	-	+
Anthrocyanins		-	-	-	+	-
Anthroquinones		-	-	-	-	+
Phenols		-	-	-	-	-

+ indicate present, - indicate absent.

Conclusion

The results of the phytochemical test carried out on the various extract, were the preliminary photochemical screening revealed the presence of carbohydrates, alkaloids, saponins, steroids, coumarins. And the presence of active constitutents were found more in hydroalcholic extract. The proximate analysis was also carried out to identify the purity of the materials. The study of following extract were selected for the free radical scavenging activity in adjuvant induced arthritic rats by determining the Lipid peroxidation in liver and plasma.

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